

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A vehicle stability compensation system which is arranged to adjust dynamically the self-centering position and the steering feel of [the] an EAS steering system during split mu braking operation, the stability compensation system comprising:

a driver feedback controller that is adapted to be connected to the steering system and is responsive to the adjustment being based on at least one operational variable representing a corrective steer angle for the vehicle to generate an adjustment which is added to the main EAS assistance torque requirement via [a] said driver feedback controller whereby to maintain the vehicle stable and controllable.

2. (Currently Amended) A vehicle stability compensation system as claimed in claim 1, comprising further including a means for establishing a braking yaw moment as said operational variable representative of a ~~correcting~~ corrective steer angle.

3. (Currently Amended) A vehicle stability compensation system as claimed in claim 2, wherein [the] said braking yaw moment is established by generating and subtracting from each other estimates of the brake pressures at the front left and front right wheels, multiplying the difference by a constant to give the difference in brake forces for the front wheels, and dividing the result by the track width of the vehicle.

4. (Currently Amended) A vehicle stability compensation system as claimed in claim 3, wherein [the] said braking yaw moment is multiplied by a gain to give the corrective steer angle.

5. (Currently Amended) A vehicle stability compensation system as claimed in claim 1, comprising further including a means for establishing a yaw oscillation moment as said operational variable representative of a corrective steer angle.

6. (Currently Amended) A vehicle stability compensation system as claimed in claim 5, wherein [the] said yaw oscillation moment is established by inverting a yaw rate signal, multiplying this by a gain and using the result as a feedback signal providing yaw

oscillation correction.

7. (Currently Amended) A vehicle stability compensation system as claimed in claim 1, ~~comprising~~ further including means for establishing a lateral drift correction as said operational variable representative of a corrective steer angle.

8. (Currently Amended) A vehicle stability compensation system as claimed in claim 7, wherein said lateral drift correction is established by inverting a vehicle lateral acceleration signal and applying proportional plus integral compensation to provide the lateral drift correction.

9. (Currently Amended) A vehicle stability compensation system as claimed in ~~any of claims 1 to 8~~ claim 1, wherein [the] said driver feedback controller ~~takes one of said operational variables, or the sum of two or more of the variables,~~ subtracts [them] said adjustment from the actual steering angle, and adds the result to the EAS assistance torque.

10. (Original) A vehicle stability compensation system as claimed in claim 9, wherein said result is added to the EAS assistance torque by way of a gain and a limiter.

11. (Original) A vehicle stability compensation system as claimed in claim 10, wherein steering velocity feedback is arranged to be applied to prevent the shift resulting in under-damped steering oscillations.

12. (Original) A vehicle stability compensation system as claimed in claim 11, wherein the driver feedback is phased out at lower speeds to avoid impeding low speed driver manoeuvres.

13. (Currently Amended) A vehicle stability compensation system as claimed in claim 1, ~~comprising~~ further including a means for establishing a yaw oscillation correction with an operational variable representative of a corrective steering velocity.

14. (Original) A vehicle stability compensation system as claimed in claim 13,

wherein said operational variable of corrective steering velocity is subtracted from the actual steering velocity and the result is added to the EAS assistance torque.

15. (Currently Amended) A vehicle stability compensation system as claimed in claim 1 wherein said operational variable representative of a corrective steer angle is a vehicle yaw rate and further wherein a vehicle model is used to generate an estimate of yaw rate from vehicle speed and steer angle.

16. (Original) A vehicle stability compensation system as claimed in claim 15, wherein said estimated yaw rate is subtracted from the actual vehicle yaw rate to give a yaw rate error.

17. (Currently Amended) A vehicle stability compensation system as claimed in claim 16 wherein said yaw rate error is passed through a compensator in order to estimate [the] a yaw moment causing the yaw rate error.

18. (Original) A vehicle stability compensation system as claimed in claim 17 wherein the estimated yaw moment is used to modify the yaw behaviour of said vehicle model.

19. (Currently Amended) A vehicle stability compensation system as claimed in claim 2, wherein the braking yaw moment is generated by ~~means of~~ a vehicle model and a compensator, as claimed in claims 15 to 18 said vehicle model being responsive to the vehicle speed and steer angle to generate an estimated vehicle yaw rate, said yaw estimated vehicle yaw rate being subtracted from the actual vehicle yaw rate to obtain a yaw rate error which is then passed through said compensator to generate said braking yaw moment.

20. (Currently Amended) A vehicle stability compensation system as claimed in ~~any of claims 1 to 19~~ claim 1, further including a means for deriving a driver compliance rating corresponding to a driver's resistance to accept additional steering demands provided by the system.

21. (Currently Amended) A vehicle stability compensation system as claimed in claim 20, ~~including wherein said~~ means for ~~establishing~~ deriving said driver compliance rating includes using a lookup map based on operational variable steering column torque.

22. (Currently Amended) A vehicle stability compensation system as claimed in claim 20, ~~including wherein said~~ means for ~~establishing~~ deriving said driver compliance rating includes using a lookup map based on operational variable rate of change of driver steering torque.

23. (Currently Amended) A vehicle stability compensation system as claimed in claim 21 [or 22], wherein [a combination of] said driver compliance rating is established based on a multiplication of the steering column torque [and] by a rate of change [or] of driver steering torque, ~~for example by multiplication.~~

24. (Currently Amended) A vehicle stability compensation system as claimed in ~~any of claims 2 to 8~~ claim 2, wherein [the] a steer angle error is established by subtracting ~~demand~~ said corrective steer angle from actual steer angle.

25. (Currently Amended) A vehicle stability compensation system as claimed in ~~claims 20 and 24~~ claim 20, ~~including wherein said~~ means for ~~establishing~~ deriving [the] said driver compliance rating includes using a lookup map based on [the] an operational variable steer angle error.

26. (Currently Amended) A vehicle stability compensation system as claimed in ~~claims 22 and~~ claim 25, wherein a combination of driver compliance ratings is established based on ~~the combined rating from claim 28 and the~~ said steer angle error of ~~claim 25 and~~ a product of steering column torque and a rate of change of driver steering torque.

27. (Currently Amended) A vehicle stability compensation system ~~having wherein~~ said driver compliance rating ~~as claimed in claim 21[or 25], or combined compliance rating as claimed in claim 26,~~ which is used to scale the EAS assistance torque ~~as claimed~~

~~in claim 9~~ for the purposes of preventing excessive torque application.

28. (Currently Amended) A vehicle stability compensation system as claimed in ~~any of claims 1 to 27~~ claim 1, including means for establishing a value representative of vehicle stability.

29. (Original) A vehicle stability compensation system as claimed in claim 28, wherein said vehicle stability value is established using a lookup map based on operational variable actual yaw rate.

30. (Original) A vehicle stability compensation system as claimed in claim 28, wherein said vehicle stability value is established using a lookup map based on operational variable yaw acceleration.

31. (Currently Amended) A vehicle stability compensation system as claimed in claim 29 [and 30], wherein a combination of vehicle stability rating is established by ~~combining~~ multiplying said actual yaw rate [and] by yaw acceleration, ~~for example by multiplication.~~

32. (Original) A vehicle stability compensation system as claimed in claim 28, wherein said vehicle stability value is established using a lookup table based on operational variable steer angle.

33. (Currently Amended) A vehicle stability compensation system as claimed in ~~claims~~ claim 31 and 32, wherein a combination of vehicle stability ratings is established by multiplying together said ratings ~~as obtained by the arrangements of claims 31 and 32~~ vehicle stability rating and a vehicle value established using a lookup table based on operational variable steer angle.

34. (Currently Amended) A vehicle stability system as claimed in claim ~~26 and~~ claim 33 wherein ~~the driver compliance rating and said~~ vehicle stability rating ~~are~~ combined with a driver compliance rating corresponding to a driver's resistance to accept

additional steering demands provided by the system, for example by multiplication.

35. (Currently Amended) A vehicle stability compensation system as claimed in claim 1 having means for variation of an ABS initial sympathetic pressure dump, the dump valve open time being based [on the] upon at least one of a driver compliance rating corresponding to a driver's resistance to accept additional steering demands provided by the system as generated in claim 26 or the and a vehicle stability rate as generated in claim 33, or on the combination of the two as claimed in claim 34 rating obtained from one of multiplying actual yaw rate by yaw acceleration and a lookup table.

36. (Currently Amended) A vehicle stability compensation system as claimed in claim 1 having means for variation of ABS front high mu pressure ramp, the apply valve time being based upon [the] at least one of a driver compliance rating corresponding to a driver's resistance to accept additional steering demands provided by the system as generated in claim 26 or the and a vehicle stability rate as generated in claim 33, or on the combination of the two as claimed in claim 34 rating obtained from one of multiplying actual yaw rate by yaw acceleration and a lookup table.

37. (Currently Amended) A vehicle stability system as claimed in ~~any of claims 1 to 36~~ claim 1, having means for generating an estimated vertical load split from vehicle deceleration and vehicle parameters.

38. (Currently Amended) A vehicle stability compensation system as claimed in claim 37, including means for generating rear pressure demand by multiplying [the] a measured front high mu brake pressure by [an] said estimated vertical load ratio as claimed in claim 37.

39. (Currently Amended) A vehicle stability compensation system as claimed in claim 38, wherein [the] a rear pressure demand is scaled by multiplication by driver's compliance [as established in claim 26 or vehicle stability as established in claim 33, or a combination of the two as established in claim 34] rating corresponding to a driver's resistance to accept additional steering demands provided by the system.

40. (Currently Amended) A vehicle stability compensation system as claimed in claim [38 or] 39 in which [then] said rear pressure demand is [filtered] passed through a filter to remove high pressure frequency components and rapid changes from demand pressure signal.

41. (Currently Amended) A vehicle stability compensation system as claimed in claim 40 including means for initialisation of [the] said filter by an enabling split mu flag from [the] a vehicle ABS whereby the initial value of [the] said filter is set to the instantaneous value of [the] a measured rear high mu brake pressure for removing any lag introduced by initialising [the] said filter at a value of zero.

42. (Currently Amended) A vehicle stability compensation system as claimed in ~~any of claims 38 to claim~~ claim 41, [having] further including means for modification of the ABS to control the high mu rear pressure to demand pressure.

43. (New) A vehicle stability compensation system as claimed in claim 30, wherein a combination of vehicle stability rating is established by multiplying said yaw acceleration by an actual yaw rate.